WHAT IS CLAIMED IS:

1. An optical switching system having a plurality of input links each with at least one wavelength, and a plurality of output links each with at least one wavelength, the system comprising:

means for separating out the wavelengths carried in each of the input links, to provide separated wavelength signals, each with a defined connection to at least one of the output links;

means for providing a Common Time Reference (CTR); and

means for mapping, comprising a stored wavelength mapping table, said means for mapping providing for a mapping of each of the separated wavelength signals to a tuned wavelength signal for the connection to at least one of the output links, responsive to the CTR signal and the stored wavelength mapping table.

2. The system as in claim 1, wherein the Common Time Reference (CTR), is divided into a plurality of time frames (TFs);

wherein the tuned wavelength signals are changeable between the time frames.

3. The system as in claim 2, wherein the tuned wavelength signal is provided by at least one of the following: a tunable laser, a tunable filter.

4. The system as in claim 3, wherein a predefined number of at least one time frame comprises a time cycle, wherein a predefined number of at least one time cycle comprises a super cycle.

5. The system as in claim 2, wherein the association of the wavelength signals with respective ones of the time frames reoccurs periodically.

6. The system as in claim 4, wherein the association of the wavelength signals with respective ones of the time frames reoccurs periodically during at least one of each of the time cycles and each of the super cycles.

7. The system as in claim 1, wherein the means for separating is further comprised of a wavelength division multiplexing (WDM) demultiplexer coupled to each input link.

8. The system as in claim 1, further comprising means for alignment of the separated wavelength signals with the CTR.

9. The system as in claim 1, further comprising means for alignment of all the wavelengths transported in each of the input links with the CTR.

10. The system as in claim 9, wherein alignment is achieved by means of adjustable delay.

11. The system as in claim 10,

wherein each of the input links has a unique time reference j (UTR-j) that is phase independent of the CTR, and wherein each of the input links has associated UTR-j time frames; and

the system further comprising an optical alignment controller, responsive to the CTR and the input link UTR-j, for determining the proper value for the adjustable delay.

12. The system as in claim 11, wherein the (UTR-j) is divided into super cycles, time cycles, and time frames of the UTR-j.

13. The system as in claim 12,

wherein the time frames of the UTR-j have the same duration as the respective time frames of the CTR.

14. The system as in claim 12,

wherein the time cycles of the UTR-j have the same duration as the respective time cycles of the CTR.

15. The system as in claim 12,

wherein the super cycles of the UTR-j have the same duration as the respective super cycles of the CTR.

16. The system as in claim 12,

wherein the super cycles of the (UTR-j) have a respective start time and end time that is one of: (1) different than the respective start time and the respective end time of the super cycles of the CTR and (2) same as the respective start time and the respective end time of the super cycles of the CTR.

17. The system as in claim 12,

wherein the time cycles of the (UTR-j) have a respective start time and a respective end time that is one of: (1) different than the respective start time and end time

of the time cycles of the CTR and (2) same as the respective start time and end time of the time cycles of the CTR.

18. The system as in claim 12,

wherein the time frames of the (UTR-j) have a respective start time and a respective end time that is one of: (1) different than the respective start time and the respective end time of the time frames of the CTR and (2) same as the respective start time and the respective end time of the time frames of the CTR.

19. The system as in claim 1, wherein the defined connection is permanently predefined.

20. The system as in claim 1, wherein the defined connection is programmable.

21. The system as in claim 20, further comprising:

means for interconnection mapping associated with each of the tuned wavelengths, wherein the means for interconnection mapping provides for mapping the respective one of the tuned wavelengths to at least one of the output links.

22. The system as in claim 21, wherein the means for interconnection mapping is comprised of at least one of: an optical cross-bar, an optical banyan network, a Lithium-Niobate optical switch, an Indium Phosphate optical switch, a 2-D MEMS optical switch, a 3-D MEMS optical switch, a semiconductor optical amplifier (SOA) based optical switch, an holographic optical switch, and bubble optical switch..

23. The system as in claim 1, wherein a plurality of the tuned wavelength signals is selectively multiplexed to a common one of the output links.

24. The system as in claim 1, further comprising:

a switch controller for loading the stored wavelength mapping table responsive to the CTR, to coordinate the assignment of the tuned wavelength signals.

25. The system as in claim 2, further comprising:

a switch controller for loading the stored wavelength mapping table responsive to the CTR, to coordinate the assignment of the tuned wavelength signals to a respective one of the time frames.

26. The system as in claim 4, wherein the mapping reoccurs during each of the time cycles.

27. The system as in claim 20, wherein the defined connection is implemented via an optical cross-connect device.

28. The system as in claim 27,

wherein the optical cross-connect device is at least one of: an optical cross-bar, an optical banyan network, a Lithium-Niobate optical switch, an Indium Phosphate optical switch, a 2-D MEMS optical switch, a 3-D MEMS optical switch, a semiconductor optical amplifier (SOA) based optical switch, an holographic optical switch, and bubble optical switch.

29. The system as in claim 27, further comprising:

a switch controller for programming the defined connection.

30. The system as in claim 20, wherein the defined connection is implemented via at least one star coupler, wherein the at least one star coupler is connected to a first subset of the input links and to a second subset of the output links.

31. The system as in claim 30,

wherein there are a plurality of the star couplers, which plurality in total defines all connections of the defined connection.

32. The system as in claim 31,

wherein the connections from the star coupler to the output links are provided via at least one of an optical multiplexer, a wave division multiplexer, and an optical filter.

33. A switching system having an input and an output, the switching system further comprising:

a first communications switch and a second communications switch connected by at least one communications link, comprising at least one channel comprised of a defined wavelength, for transmitting a plurality of data units from said communications link to the output of the switching system;

a Common Time Reference (CTR), divided into a plurality of contiguous periodic super cycles (SCs) each comprised of at least one contiguous time cycle (TC) each comprised of at least one contiguous time frame (TF);

wherein each of the communications switches is further comprised of a plurality of input ports each with at least one wavelength and a plurality of output ports, each with

at least one wavelength, each of the input ports connected to and receiving data units from the communications link from at least one of the channels, and each of the output ports connected and transmitting data units to the communications link over at least one of the channels;

means for separating out the wavelengths carried in each of the input ports, to provide separated wavelength signals, each with a defined connection to at least one of the output ports;

wherein each of the communications links is connected between one of the output ports on the first communications switch and one of the input ports on the second communications switch; means for mapping, comprising a stored mapping table, said means for mapping providing for a mapping of each of the separated wavelength signals to a tuned wavelength signal, for the connection to the at least one of the output ports, responsive to the CTR signal and the stored mapping table;

wherein the means for mapping defines the coupling from each one of the respective input ports for data units received during any one of the time frames, on a respective one of the channels, for output during a predefined time frame to at least one selected one of the respective output ports on at least one selected respective one of the channels; and

wherein the data units that are output during a first predefined time frame on a selected respective one of the channels from the respective output port on the first communications switch are forwarded from the respective output port of the second communications switch during a second predefined time frame on a selected respective one of the channels responsive to the CTR.

34. The system as in Claim 33,

wherein the tuned wavelength signals are changeable between the time frames.

35. The system as in Claim 33, wherein the tuned wavelength signal is provided by at least one of the following: a tunable laser, a tunable filter.

36. The system as in Claim 33, wherein the wavelengths associated with respective ones of the time frames reoccurs periodically.

37. The system as in Claim 33, wherein the wavelengths associated with respective ones of the time frames reoccurs periodically during at least one of each of the time cycles and each of the super cycles.

38. The system as in Claim 33, wherein the means for separating is further comprised of a wavelength division multiplexing (WDM) demultiplexer coupled to each input port.

39. The system as in Claim 33, further comprising means for alignment of the separated wavelength signal with the CTR.

40. The system as in Claim 33, further comprising means for alignment of all the wavelengths transported in each of the input ports with the CTR.

41. The system as in Claim 40, wherein alignment is achieved by means of adjustable delay.

42. The system as in Claim 41,

wherein each of the input ports has a unique time reference j (UTR-j) that is phase independent of the CTR, and wherein each of the input ports has associated UTR-j time frames;

the system further comprising an optical alignment controller, responsive to the CTR and the input link UTR-j for determining the proper value for the adjustable delay.

43. The system as in Claim 42, wherein the (UTR-j) is divided into super cycles, time cycles, and time frames of the UTR-j.

44. The system as in Claim 43,

wherein the time frames of the UTR-j have the same duration as the respective time frames of the CTR.

45. The system as in Claim 43,

wherein the time cycles of the UTR-j have the same duration as the respective time cycles of the CTR.

46. The system as in Claim 43,

wherein the super cycles of the UTR-j have the same duration as the respective super cycles of the CTR.

47. The system as in Claim 43,

wherein the super cycles of the (UTR-j) have a respective start time and end time that is one of: (1) different than the respective start time and the respective end time of

the super cycles of the CTR and (2) same as the respective start time and the respective end time of the super cycles of the CTR.

48. The system as in Claim 43,

wherein the time cycles of the (UTR-j) have a respective start time and respective end time that is one of: (1) different than the respective start time and end time of the time cycles of the CTR and (2) same as the respective start time and end time of the time cycles of the CTR.

49. The system as in Claim 43,

wherein the time frames of the (UTR-j) have a respective start time and a respective end time that is one of: (1) different than the respective start time and the respective end time of the time frames of the CTR and (2) same as the respective start time and the respective end time of the time frames of the CTR.

50. The system as in Claim 33, wherein the defined connection is permanently predefined.

51. The system as in Claim 33, wherein the defined connection is programmable.

52. The system as in Claim 33, further comprising:

means for interconnection mapping associated with each of the tuned wavelengths, wherein the means for interconnection mapping provides for mapping the respective one of the tuned wavelengths to at least one of the output ports.

53. The system as in Claim 52, wherein the means for interconnection mapping is comprised of at least one of: an optical cross-bar, an optical banyan network, a Lithium-Niobate optical switch, an Indium Phosphate optical switch, a 2-D MEMS optical switch, a 3-D MEMS optical switch, a semiconductor optical amplifier (SOA) based optical switch, an holographic optical switch, and bubble optical switch.

54. The system as in Claim 33, wherein a plurality of the tuned wavelength signals is selectively multiplexed to a common one of the output ports.

55. The system as in Claim 33, further comprising:

a switch controller for loading the stored wavelength mapping table responsive to the CTR, to coordinate the assignment of the tuned wavelength signals.

56. The system as in Claim 33, further comprising:

a switch controller for loading the stored wavelength mapping table responsive to the CTR, to coordinate the assignment of the tuned wavelength signals to a respective one of the time frames.

57. A switching method for use with a switching system having an input and an output, the switching system comprising a first communications switch and a second communications switch connected by at least one communications link comprising at least one channel comprised of a defined wavelength, for transmitting a plurality of data units from said communications link to the output of the switching system wherein each of the communications switches is further comprised of a plurality of input ports each with at least one wavelength and a plurality of output ports, each with at least one wavelength, each of the input ports connected to and receiving data

units from the communications link from at least one of the channels, and each of the output ports connected and transmitting data units to the communications link over at least one of the channels; the method comprising:

providing a Common Time Reference (CTR), divided into a plurality of contiguous periodic super cycles (SCs) each comprised of at least one contiguous time cycle (TC) each comprised of at least one contiguous time frame (TF);

separating out the wavelengths carried in each of the input ports, to provide separated wavelength signals, each with a defined connection to at least one of the output ports;

connecting each of the communications links between one of the output ports on the first communications switch and one of the input ports on the second communications switch;

mapping each of the separated wavelength signals to a tuned wavelength signal, for use in providing the defined connection to the at least one of the output ports, responsive to the CTR signal;

coupling, from each one of the respective input ports for data units received during any one of the time frames, on a respective one of the channels, for output during a predefined time frame to at least one selected one of the respective output ports on at least one selected respective one of the channels responsive to the mapping; and

outputting the data units during a first predefined time frame on a selected respective one of the channels from the respective output port on the first communications switch and forwarding from the respective output port of the second communications switch during a second predefined time frame on a selected respective one of the channels, responsive to the CTR.

58. The method as in Claim 57, further comprising:

changing the tuned wavelength signals between the time frames.

59. The method as in Claim 57, wherein the tuned wavelength signal is provided by at least one of a tunable laser, and a tunable filter.

60. The method as in Claim 57, further comprising:

associating respective ones of the wavelengths with respective ones of the time frames on a periodically reoccurring basis.

61. The method as in Claim 57, further comprising:

associating respective ones of the wavelengths with respective ones of the time frames on a periodically reoccurring basis during at least one of each of the time cycles and each of the super cycles.